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ASTRONAUTICS - FOR TEACHERS AND YOUTH (1)

by

Krystyna Lukasik

FOREIGN TECHNOLOGY DIVISION

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ASTRONAUTICS - FOR TEACHERS AND YOUTH (1)

by

Krystyna Lukasik, M.S.

REPRESENTATIVE CHARACTERISTICS OF MODERN CIVILIZATION AND ASTRONAUTICS

One of the principal tasks of modern education is to acquaint young people with the intricate problems of modern life, with their proper solutions and with finding an appropriate position for oneself, or in brief: the proper orientation and preparation of a young person for the present day.

In order to cope with this, he must be introduced to the sometimes stormy advance of civilization and, taking the rapidly occurring changes in all areas of life into account, shown the additional possibilities for its development. Youth must understand the phenomena taking place around them, the characteristics and directions of today's civilization, so that they might join in its further normal development in the future. If this is not done, a collision with progress will occur, the consequences of which will be a slowing-down in the rate of development in science and many areas of the economy, i.e., a set-back in progress.

Astronautics belongs among the most significant achievements of civilization; a grasp of the nature of current trends in civilization includes, among other things, an awareness of the progress, achievements and prospects for development in astronautics. Many of the problems in present-day advances are difficult to impart and explain to young people, but astronautics, with attractive examples at its disposal, can simplify the fulfillment of this task.

The principal characteristics of modern civilization are the rapid advance of science and the intensive development of many branches of engineering. New inventions, technical improvements, modern design

solutions and successful experiments are repeatedly appearing. Astronautics stands at the forefront of the leading ~~directions~~ fields in terms of rate of progress and boldness in introducing modern solutions.

In an effort to cope with the ambitious plans and daring goals for studying the cosmos, methods are being constantly improved and expanded~~,~~ in the manufacture of materials, complicated instruments and scientific research. Many materials and alloys have been invented for the needs of astronautics that possess excellent mechanical, physical and chemical properties and have an application under the conditions of outer space. They retain their mechanical strength over a wide range of temperatures and play a protective role against cosmic and solar radiation and against micrometeorites. These materials are resistant to stress, vibration, shock and a characterized by good insulating characteristics. Structures and spacecraft parts made from them are of low mass, multifunctional and long-lasting. Some of the elements used to equip satellites, probes, or spacecraft must be very long (e.g., antennas), which can render their transport very difficult, or simply impossible. Resistance to bending is useful in this situation and the elasticity of the material makes it possible for them to be wound up into small rolls and then extended when in space.

The equipment used in astronautics is also characterized by high precision and reliability of action. ~~Digital machines~~ Computers and electronic measuring equipment, which become a well-known standard for similar equipment used in various branches of technology around the world, are the leading examples in this area.

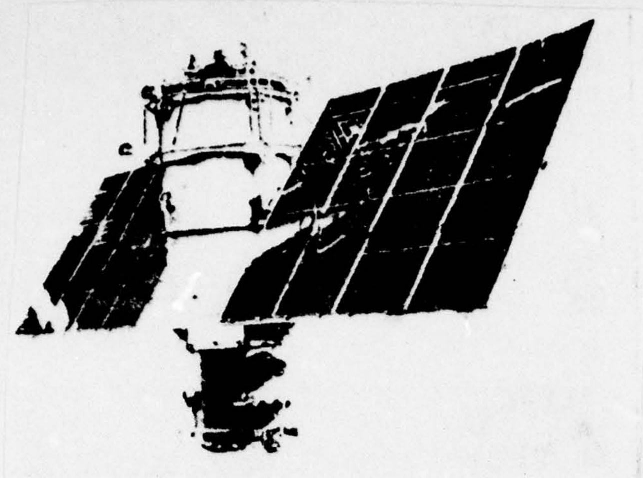
Thanks to new or improved technologies for processing materials, including welding, cutting and forming them, and thanks to the previously mentioned advantages of new materials, automatic research installations of complex design and that perform diversified functions are being built, along with ~~vessels~~ vehicles that move at unusual speeds and operate with extreme precision under the difficult conditions of outer space. Modern erection technology has permitted the creation of gigantic buildings, rocket structures, transport platforms and mobile launching towers at space complexes, whose dimensions exceed those of all the other structures of this type previously built on earth.

Other phenomena that are characteristic of our time have also become clearly apparent in astronautics. Thus, we have, on the one hand, advanced specialization in individual scientific areas (e.g., molecular aerodynamics, magnetohydrodynamics) and practical technological activities (e.g., the ~~formation~~ creation of extremely thin coatings, welding in a vacuum), while on the other hand, we have a pooling of resources from various sciences and the interaction of several disciplines with each other (biochemistry, agricultural mechanization, industrial medicine, medical engineering, occupational sociology in industry, etc.).

Astronautics is an area which also developed owing to contributions from many sciences and the unification of various trends, and it has undergone at the same time processes of advanced specialization. Examples cited from it clearly illustrate this characteristic dynamism of knowledge in our time. Astronautics arose thanks to progress in astronomy, astrophysics, physics, chemistry and mathematics, many areas of technology and their interaction, and as time went by, the methods of studying it gradually began to improve and a series of new specialized fields emerged, such as: the physics of outer space, the technology of materials used for building spacecraft and the technology of integrated circuits.

An understanding of these facts by future workers in the various scientific and industrial plants is a necessity that will guarantee adequate development and progress. Every good specialist and scientist must know how to use the achievements from various disciplines and branches of technology in order to apply them to his needs. If, on the other hand, he wants to play a positive and creative role in his own area, he must remain within the limits of narrow specialization.

1. Soviet cosmonaut A. Eliseev during his visit to Warsaw.



2. A Soviet weather satellite of the "Meteor" series.

SCIENTIFIC AND ENGINEERING ACHIEVEMENTS OF ASTRONAUTICS AND THEIR EFFECT ON MODERN KNOWLEDGE

Raising and educating young people to play a role in events of the present and near future, to some extent or another, ~~can~~ must not fail to acquaint them with the most recent achievements in science and technology. Since successes in the conquest of space should be included among these achievements above all, the need for familiarity with astronautical events is obvious.

Among other things, therefore, young people should be given the results of research that has been done in the neighborhood of the earth, namely, studies dealing with the physicochemical conditions of the atmosphere, ionosphere and magnetosphere and their influence on our planet. Young people should be familiar with the protective importance of terrestrial magnetism as well as ~~be~~ provided with a general outline, at least, of research results from the moon, Venus, Mars and observations of the sun that have been made thanks to the fact that the appropriate instruments have been placed beyond our atmosphere. Other things that merit attention include the attainment of the previously inaccessible region of outer space, beyond the limits of the earth's influence and its atmosphere, the discovery of new physical phenomena, e.g., certain types of cosmic radiation, as well as the possibility for experimental verification of many phenomena and scientific theories, e.g., the behavior of matter in reduced gravity and weightlessness, the validity of Einstein's theory of relativity. We are becoming ever better acquain-

ted with the structure of the moon and nearby planets, and we are improving and correcting our understanding of the earth with repect to its shape, mass, dimensions, etc. Progress in astronautics has engendered an expansion in a number of sciences and created new scientific disciplines, such as space biology, space medicine and space psychology.

To achieve space flights, rocket technology had to be developed along with ~~and~~ the technology of heat-resistant materials suitable for both it and for the present, in ~~for~~ various branches of industry ~~as well~~. New rocket fuels have been invented, the first nuclear engines and new sources of power for the diversified systems aboard spacecraft have been built, and new methods of assembly and quality control of materials have been developed, along with new methods of checking the reliability of the instruments that have been built.

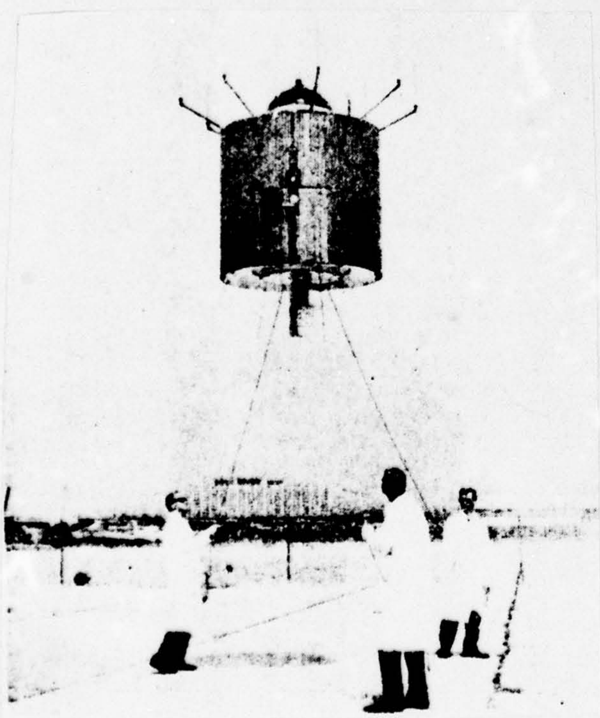
A number of improvements and modifications have been obtained in radio engineering, electronics and cybernetics. The numerous design solutions and the trend toward the greatest possible miniaturization in instruments should also be mentioned. These achievements in astronautics have been taken up and used by various branches of science and engineering and this has caused the significant progress and development that is perceptible in everyday life. The marked improvement in transmitting and receiving equipment and the new ~~radar~~ high-power radar equipment are good examples from the field of radio engineering.

Another example is the construction of photoelectric switches that enable us to turn on or turn off radios and televisions, lights, to open doors, to switch on alarm devices. These seemingly improbable improvements can render ~~seriously~~ ill or infirm people and invalids independent from another person's help to a certain extent. In the area of electronics, we should emphasize the exceptional strength and independence of action of the equipment installed on the surface of probes and communications satellites, which are used for experiments

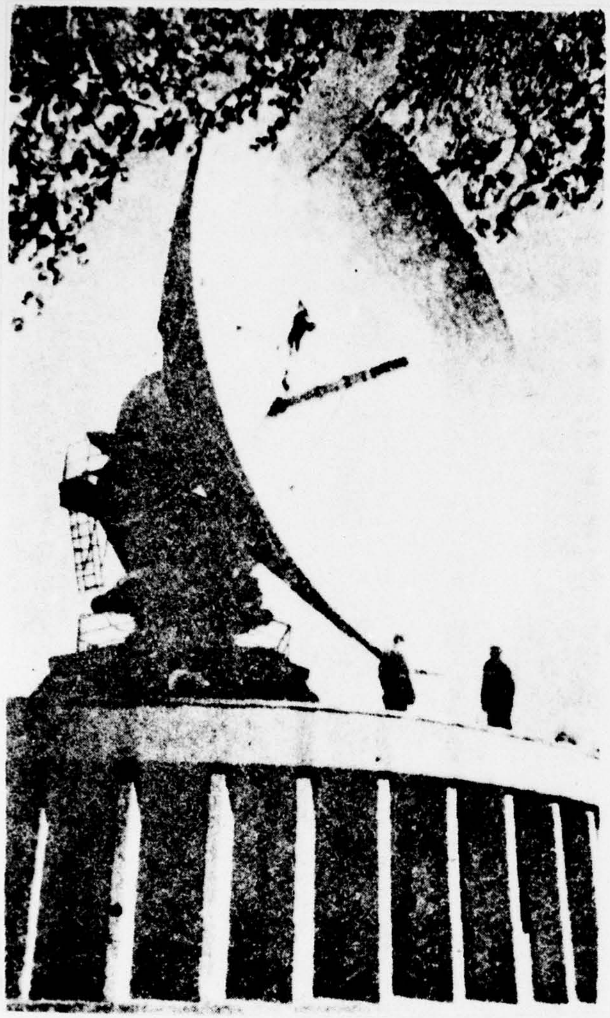
under the extremely difficult conditions in outer space. This improved equipment has also found application on earth, which has led to an increase in quality and accuracy in experiments performed with their help.

Ever more frequently, a number a countries are making use of the new materials and equipment in various branches of industry. These materials and equipment are more suitable than those used in the past, and they came into being owing to the needs of astronautics. Thus, in various parts of the metallurgical and electrical industries, as well as in construction, new materials and improvements are being used. Multiphase materials have gained special recognition. These are metals or plastics reinforced with glass, fibers and powders of different materials, which exhibit many advantages in practice and which have a bright future ~~before~~ ahead of them.

Equipment that protects man from dangerous environmental factors (radiation, high temperature, toxic or irritating substances) has also gained indisputable recognition. An example of such an apparatus, which



3. An American experimental communications satellite of the "ATS" series.



4. Ground station of the Soviet satellite communications system, "Orbita".

traps minute wastes that are harmful to the crew, during mechanical processing, is the vacuum separator. New technical developments from astronautics have also found application in several areas of lifesaving, in medical diagnostic and therapeutic equipment, and in laboratory apparatuses used in physics and biology.

We are indebted to artificial satellites for new research methods in geology and geodesy; they supply data on the sculpture of the terrain, the geological structure of areas under study, the natural resources in poorly accessible regions of the earth's crust. They also are of great importance in agriculture and forestry; they provide information on the degree of soil moisture, the number and types of water reservoirs, soil management conditions, and even plant and animal formations, identifying their type and number and detecting trees that have been attacked by pests, ~~and~~ evaluating the condition of agricultural crops, etc.

Artificial satellites are now irreplaceable in meteorology for preparing weather forecasts. Due to the fact that they are equipped with ample instrumentation, they can collect data relating to the true content of chemical compounds in the air and on atmospheric currents. Navigation satellites simplify recovery of lost ships and aircraft and speed help to them in emergencies.

One of the greatest advantages derived by human economy on ~~the~~ earth from astronautics is the substantial progress in communications. Thanks to communications satellites, in orbit at high altitudes, it is possible to transmit radio and television programs over great distances, and the transfer of telephone conversations between people that are separated by great distances is simplified. Television relay stations installed in satellites make it possible for valuable programs to be supplied to the farthest corners of the globe, which effects a spread of learning and progress in economically and socially underdeveloped countries.

The dynamic development of astronautics enables us to predict that it will provide in the future the solution to many scientific problems that have intrigued mankind for a long time. Thus, we will acquire new, possibly sensational information regarding our planetary system and neighboring systems, which will cause further developments in a number of disciplines, e.g. physics and biology. Knowledge and the explanation of a number of phenomena will introduce fundamental changes to our views on the origin and spread of life, and thus, on the history of the origin and development of man.

Scientific and engineering successes in astronautics can even have a decisive influence on the development of industry, particularly communications and telecommunications. New propulsion methods have greatly increased the velocity of space vehicles and this will permit plans to be made for interplanetrary travel. Thanks to reusable rockets, intercontinental communication on earth will be improved and accelerated remarkably.

Even a field such as law had to examine certain ideas and regulations, to adapt them to the new circumstances that arose with the entry of man into outer space, which had been untouched until recently. Space law has emerged. It regulates the relations between nations in terms of their activity in space. This is done so that the tremendous effort to learn about space will not be hindered, nor the fruits of these efforts squandered.

Thus, progress in astronautics exerts a significant effect on many areas of science and technology, as well as on the development of almost all of present-day and future knowledge. The most important achievements of astronautics that have been cited, especially the continuously expanding reach of its activity into life, leads to the conclusion that it is already high time to begin a deliberate and organized method of acquainting young people with its problems.

THE INSTRUCTIONAL AND EDUCATIONAL ADVANTAGES OF ASTRONAUTICS

In educating young people, we frequently encounter a lack of skill in handling their entire store of information or in selecting from it in order to solve a very general problem that borders on several disciplines. In this case, astronautics can be of help, since, due to its integrated nature, it has examples at its disposal that can instruct how to take advantage of the entire store of possessed knowledge for a correct and complete understanding of certain problems.

Astronautics can also be used at times as a visual aid to help young people understand written theoretical material, e.g., to explain phenomena such as a vacuum or weightlessness based on a film that depicts the training or flights of cosmonauts under simulated or real space conditions.

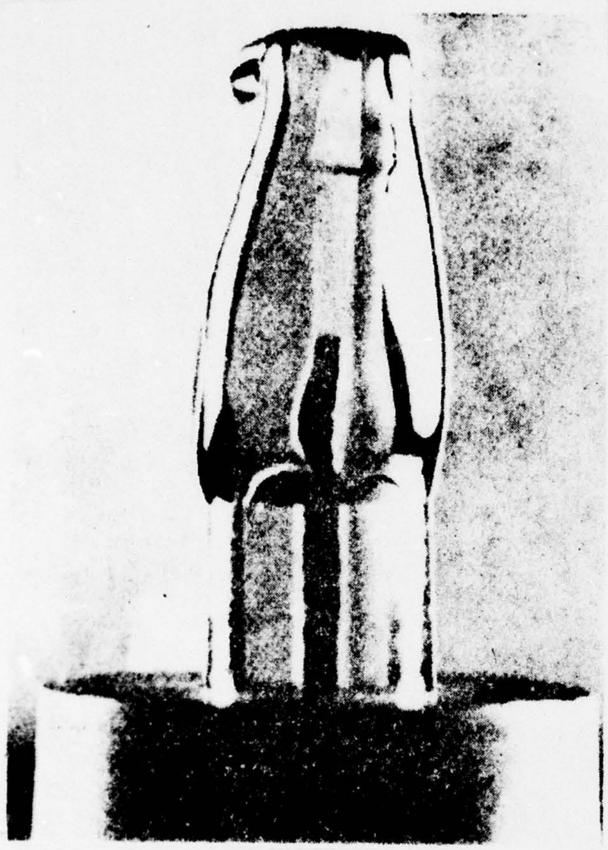
All of the most important scientific undertakings, as well as innovative efforts in branches of industry, are primarily the result of collective work. In the second half of the twentieth century, the solution of a single problem sometimes requires information from seve-

ral disciplines, as well as the help of many instruments that simplify or simply make possible its correct resolution and accomplishment in accordance with the present-day requirements. Research, and even more-so, achievements by a single scientist primarily belong to the past. We now hear about new operating techniques~~,~~ used by a group of doctors, about interesting urban planning designs developed by a team of architects, etc. In addition, people representing educational fields and various specialties are now collaborating ever more frequently. For the proper functioning of industrial plants, not only the skills and knowledge of engineers and technicians are required, but also those of economists, sociologists and psychologists. ~~The~~ A need to humanize the engineering fields is emerging, along with ~~the~~ a need to train biologists and humanities specialists to handle modern technical equipment.

A very large group of people participates in the accomplishment of planned technical ventures; both leading specialists as well as people who are assigned assisting roles, which, nevertheless, are important for achieving the proper results. All of these people must be assured proper working conditions and positions, and above all, it must be possible for them to collaborate efficiently and in harmony. A lack of proper coordination of activities and functions could lead the entire venture to a fiasco. Thus, we come to one of the leading problems of the present - modern industrial production organization. Skill in applying this to life is necessary for young people, who in the not too distant future will be augmenting the groups working in Polish industry, some of them occupying positions of responsibility. The younger generation must be prepared for this role and shown examples of correct administration and coordination of work in large manufacturing facilities or scientific institutes.

An example of very good work organization and its successful results are the production processes of the astronautical industry, which must accomplish long-range plans for space flights with great precision. The accomplishments of astronautics are the fruits of a gigantic effort by a vast group of people, composed of representatives from many scien-

tific and industrial facilities, specialists from the most varied branches of knowledge and a large number of assistants. In order for such a large group of people to be able to work in harmony and achieve the desired results, work must be based on the latest methods of organization. For this reason, borrowing examples from the area of astronautics a~~s an example,~~ will be the best lesson for future managers in modern industrial manufacturing.



5. An indium antimonide monocrystal - an important semiconductor material - of unusual excellence, grown aboard the "Skylab" space station.

The impressive object of a space rocket or spacecraft owes its creation to the work of scientists, designers, laboratory assistants and workers. At work in the astronautical centers are people at various levels of the professional hierarchy, representing different areas of interest and degrees of aptitude and skill. It must be added that these workers are obviously characterized by different personalities. The successes of astronautics are the effect not only of the most pre-

cisely devised plans, but also of the accuracy and honesty with which they are carried out by the entire group without exception, which accomplishes the tasks set before it smoothly and with harmony.

Absolute discipline and punctuality is required from each worker, since a delay in one activity results in a set-back in the production cycle, whereas non-fulfillment of a task by part of the collective, or sometimes only by an individual, can cause a collapse in the plan and even the entire venture. Errors due to thoughtlessness or oversight can involve considerable costs, and more importantly, loss of life of very valuable people, who will be spending time in the ~~objects~~ vehicles made.

It might appear that under these conditions workers might ~~get~~ have to dispense ~~over~~ with their individual interests and become robots. This is not at all the case, however, for there are so many possibilities of work in the astronautics industry that everyone can find an outlet for his own interests. Industries in countries with a high level of civilization have adopted this style of work. We must acquaint our youth with this type of work above all, since they will be entering industrial production within a few years.

Examples of the cooperation and coexistence desired in manufacturing processes are necessary for young future workers. This can be described as the proper working atmosphere. Above all, our young people must be taught the great skill that makes up work ethics, namely, maintaining the appropriate proportion of personal and social interest.

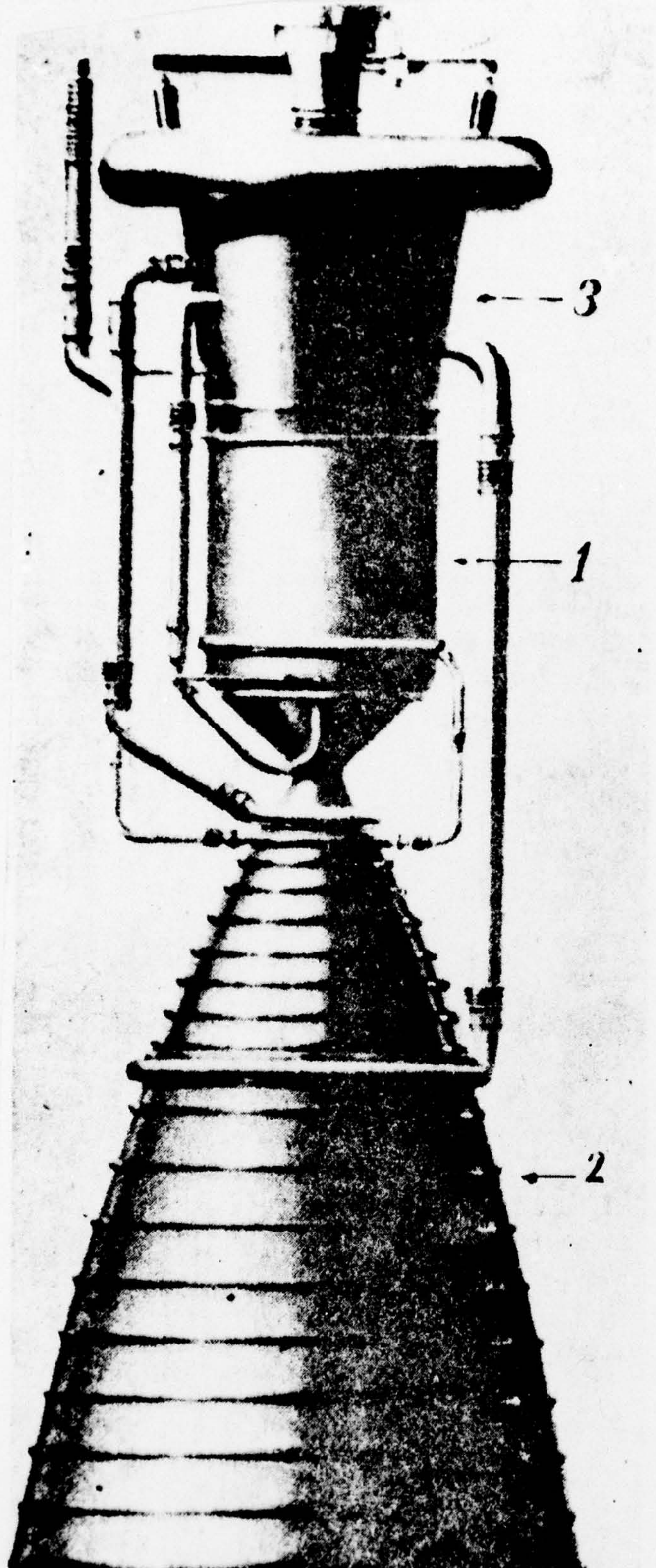
Respect for the effort and individual traits of one's comrades, appreciation of the value of work in a group, an objective evaluation of one's own worth and role within a collective will guard against the danger of isolation from society. In order for a group of people to be able to work together, it must have a common idea and a common goal.

The collective of an astronautics center possesses this idea and this purpose and takes upon itself a common responsibility for choosing the methods and means to achieve it. Comradeship here is based on the most reliable principle, that of the work ethic, which cannot be violated under any circumstances.

The work of these people takes place under difficult and complicated conditions in terms of frequent changes that are caused by the introduction every so often of new, improved materials, equipment and engineering methods. There is no time here for prolonged familiarization with new ideas. The exchange of scientific and technical information between the various groups and institutes that are fulfilling a defined task must take place efficiently. Improvements and inventions must be assimilated rapidly so that the space experiment can be made cheaper, improved and speeded up. The rapid pace caused by deadlines, unforeseen obstacles and difficulties that must be eliminated immediately needs people who are physically and emotionally strengthened. Work-time here is often unlimited and in the days preceding an experiment, all of the workers give their maximum efficiency and preparedness. For this reason, the staff of astronautical centers is composed of people who are self-controlled, capable, intelligent, hard-working and quick-witted.

These people must quickly carry out the decisions of their superiors, and even in certain exceptional situations make the decision that is most apt themselves. The emotional characteristics necessary for workers in institutes associated with astronautics are: ability to concentrate, rapid thinking and analysis of a situation, critical judgment and objectivity. In making a decision, personal ambition or bias against solutions that are not in agreement with one's own propositions must not be involved. These are requirements that guarantee the best possible outcome of an experiment and the greatest safety for the personnel.

Work under difficult situations that are full of stress, especially the final preparations preceding the launch of rockets with a



6. Prototype of a nuclear rocket engine, situated on the ground: 1 - nuclear reactor, fission type; 2 - exhaust nozzle; 3 - system for introducing the working substance (hydrogen) into the reactor.

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research device and, above all, of a spacecraft with a human crew, is a great test of emotional strength for the entire staff. The most ~~threatening~~ hazardous are passenger craft, but all of the workers on the base, above all the management, are responsible for the flight. A happy ending to the expedition depends on the management's ability, its calm and objective evaluation of the situation, and ~~their~~ its consideration of the most suitable variants in solving the problem.

At space facilities and experimental centers, the operations are extremely safe, and the results obtained prove again and again that greater patience and even generosity is required. Of the additional good points of these people, we can mention honesty, not only as a necessary condition for confidence between managers and their associates, but above all, as a guarantee of safety for the

passengers. Defective work, e.g., the failure of equipment parts to fit properly, inadequate checking of their function or improper verification of the strength of the materials in use - and thus, damage to the craft, places the crew in risk of life-threatening danger. Successful tests, probes, flights and returns to earth are a contribution of all the workers. It is the result of collective, serious and honest work.

The virtues of character mentioned above must be related to knowledge that will preclude the possibility of mistakes. Every motion, each step forward must be intentional and efficient; there is no place here for superfluous or incorrect actions, for every mistake can result in appreciable losses. The basis for proper action in industries connected with astronautics is thorough professional preparation. The workers employed here must be educated people who are equipped with current, continuously developed knowledge. The requirements mentioned intensify to a maximum for cosmonauts, who after leaving the earth, must perform difficult and unusual tasks under outer-space conditions that are hostile to the human body.

Not only technical progress, but the training and emotional resistance of a spacecraft's crew as well are deciding factors in the success of astronautical ventures. Good health, physical endurance and mental fortitude are the traits of a cosmonaut. For this reason, the only people who have a chance to take up this extraordinary profession are those who achieve unconditionally positive results that will guarantee the successful completion of the entire, sometimes very complicated journey, which comprises several phases: launch from earth, the performance of various technical activities during the flight, landing on a heavenly body or orbiting station, taking off from it and returning to earth.

A cosmonaut-candidate, meeting all of the physical, psychological and intellectual requirements, is close to the modern ideal of man. Young people are searching for the ideal modern man, and educators are also seeking an analogous ideal to be a guiding principle for youth.

Education strives for equal physical and emotional development in young people. Its task is to educate intelligent, healthy and competent people. In life, these traits rarely go hand in hand, yet their concomitance in modern man is ever more indispensable. The accomplishment of important plans can only occur with complete efficiency of mind and body. Cosmonauts convince us of this, since their virtues of intellect and character go hand in hand with physical strength.

Many young people set themselves to daring and fine tasks. It is not true that youth are striving for easy tasks and that their only goal is a good living. Only a small number can be blamed of this. The majority want to live an interesting and useful existence. It is fortunate that new institutes, industrial facilities and institutions are coming into being from time to time. We are encountering new departments, workshops, research topics and professions. This is a very auspicious phenomenon, for it testifies to the development of the economy and science, thus opening up various possibilities for young people, but also placing difficult and responsible tasks before them.

Today, when there are large numbers of young people and adolescents being educated among us, in order to obtain an interesting occupation, and especially a responsible position, they must be shown the corresponding qualifications and abilities that are required. Young people must be spoken to and shown facts that confirm our words that economic effects and, as a consequence, progress and national prosperity, depend on the information possessed by workers and the work provided by them. Young people must decide on their choice of career, their school, course of study, work. These decisions are important both for them and for the occupations which must employ their hands and minds in the future. What can be done to ensure that this choice will be proper and useful for both sides - young man and employer?

In addition to checking knowledge, for which examinations during

school and studies are used, appropriate tests relating to the emotional and physical traits of c~~na~~andidates can be of help in choosing certain careers. They also undergo medical exams and psyc h ological tests. Sometimes the choice turns out to be the right one, and sometimes the testing methods prove to be inadequate and the new worker does not fulfill ~~the~~ other's expectations of him, or himself is disappointed.

Astronautics has accurate methods at its disposal that almost do not permit errors. In an affort to determine the psychophysical characteristics that will ~~appear distinctly~~ show up in abnormal, stress situations, a cosmonaut-candidate undergoes a series of thorough and ingenious tests. In order to be admitted to these tests, however, he has to pass through a very strict initial screening. Experts in astronautical problems ~~produce~~ create a series of conditions that few can satisfy. Here it is a matter of age, weight, physical condition, education, and often, training in aviation. ~~The~~ A small group, then, is admitted to the initial tests, whose purpose is to verify the overall emotional and mental predispositions, as well as physical strength.

After these initial tests, a prolonged and strenuous period of training begins. It involves the theoretical study of several subjects and practical application of assimilated knowledge, mainly from the field of astronomy and selected areas of: physics, chemistry, biology, medicine, mathematics, from the standpoint of their suitability to the situations and needs occurring during spaceflight, ~~and~~ with astronautical studies as the final goal of these efforts. In addition to lectures and exercises, the candidates go through intensive physical training, which is necessary for continuous improvement in the overall condition.

In order to cope with all of the requirements, the daily training routine of the candidates is strict and disciplined; it includes precise compliance with a planned diet, and the rigors of maintaining a timetable for training. The most difficult aspects are the exercises under simulated conditions of spaceflight; the cosmonaut-candidates are subjected to the action of high and low temperatures, high pressure, vibration, fatiguing noise as well as fatiguing quiet. A

number of devices have been built that test equilibrium, resistance to acceleration and similar effects that the cosmonaut might encounter during spaceflight. The overall training of cosmonauts should determine to what extent ~~how~~ exacting work requires self-denial and patience. It lasts for several years and is not always crowned with spaceflight. The period of preparation for a career as a cosmonaut offers us a standard example of patient and persistent striving for a goal.

Patience does not belong to those virtues, about which the majority of our young people can boast. Young people primarily want to see the effects of their efforts and actions as quickly as possible. If the results are not plainly evident and the goal too distant, they quickly become discouraged and must be encouraged to new energies that will enable them to continue their efforts in the intended direction.

The above-mentioned difficult and complicated path to astronautical successes can be outlined in educating young people. Astronautics is a field in which the effects of an applied effort are clearly evident. They appeal to people who admire them for their attractive form and imposing results, but for this glamor it was necessary to devote prolonged and strenuous efforts. Pointing out examples of persistence in people admired by the entire world certainly can play a positive role in education. By m~~M~~entioning them and drawing the proper conclusions from them, we will be complying with the old, but nevertheless always useful maxim, that we should educate by example.

If, with the help of education, we want to find a teaching norm that would be willingly accepted by young people, we should keep their tastes and their likes and dislikes in mind. This should involve the example of a young people's hero, the embodiment of their dreams and longings, as well as an educational ideal that summarizes the values of spirit, mind and body desired by modern education. This example should correspond to widely accepted requirements of humanism and be in agreement with the requirements of the present and the foreseeable future. Today's youth must be shown modern forms in their authentic situations, rather than examples of people transplanted into the present from distant times whose values are often strange, instead

of the same. Astronautics fulfils these requirements. It has at its disposal facts and real people, upon whom great demands are made, but it opens the way to well-earned fame.

It should be added that thanks to radio, television and films, the modern hero is no longer a fictional character and an abstraction. We see him, hear him, associate with him as if he lived among us. He makes an impression on us with his courage and self-control; we take part in his efforts, when he struggles with difficulties or his own weakness; we observe his behavior during spaceflight and we welcome him as a ~~winner~~ victor after his return to earth.

The hero-conqueror shown to young people would not be transformed into a real person if the taste of set-backs or even defeat were foreign to him. Even in astronautics, not everything is successful, not everything is achieved, but failures do not disappoint. On the contrary, after critical evaluation of previous ventures, they ~~excite~~ induce us to undertake new tests and projects. Such an attitude is interesting to young people, and it is ~~a~~ valuable and worthy of imitation.

Young people must be shown ~~the~~ a wealth of details from the life of people in astronautics, their personalities as reflected in their work, achievements and even their failures. The possibility exists to show a modern hero, renouncing the amusing and the harmful, although ~~but although~~ unfortunately, among some youths the type of hero from erotic, criminal or western films still remains popular. The position of the conqueror of beautiful women and fortunes is to be replaced by the hero on a grand scale - the conqueror of the secrets of the universe.

Modern education must make use of the previously mentioned traits of the modern hero. This is already being done, after all, by Soviet education with success. There, knowledge about conquerors of the cosmos is disseminated in the schools and youth organizations, along with the well-earned respect surrounding them.

In The News-Cameraman's Lens

From the XXVI International Astronautics Congress in Lisbon. In the photo: chairman of the Soviet delegation academician Prof. Leonid I. Sedov, honorary member of the Polish Astronautics Association (center), Prof. Wladyslaw Fiszdon, vice-chairman of the International Astronautical Federation (left), and Prof. Antoni K. Oppenheim from the University of California (right).

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E408	AFWL	1
E410	ADTC	1
E413	ESD	2
	FTD	
	CCN	1
	ASD/FTD/NICD	3
	NIA/PHS	1
	NICD	2